

AN ASSESSMENT OF THE TRANSITION TO VIRTUAL LEARNING IN THE OECS

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## Abstract

This project employed a descriptive survey design to understand the characteristics of education systems and practitioners in the OECS in the application of virtual teaching as a response to the COVID-19 pandemic. The findings outline some of the major challenges associated with regional efforts to successfully integrate ICTs in education. There appears to be consensus that Virtual Learning Environments (VLEs) can well support ambitions for improving equity of access to education, as well as the quality and the relevance of education. What this assessment reveals, is that there is wide disparity in the region with respect to approaches to adopting and adapting to VLEs.

This paper places emphasis on the importance of teachers' online pedagogical skills and technological skills as essentials to the successful implementation of technological interventions. It also explores the question of what constitutes an effective VLE and applied a technology matrix to evaluate the effectiveness of e-platforms employed during the transition to online instruction in the OECS. Broadly, this research presents a snapshot of what the experience has been in the OECS region with the rapid transition to online learning. Generally, the findings reveal that as was the case with many other countries the education systems of the OECS were inadequately poised to transition smoothly to online learning.

## Introduction

The member states of the OECS are a cluster of Small Island Developing States (SIDS). SIDS are characterized as being very vulnerable to external shocks and disruptions. In addition, many of these small states struggle to provide adequate educational opportunities for all. Many of their education systems rely on grant funding and technical assistance from outside. As such, the pace of changes within these systems to accommodate new paradigms has been slow. The promise of e-Learning and online instruction has long been touted in the region, but the delivery of that promise has been incremental at best.

The hurdles to fully integrating ICT in education and fully deploying online learning strategies are categorized as follows:

Table 1.

*Constraints to ICT Integration - OECS*

Policy	Infrastructure	Pedagogical Support
Underdeveloped ICT in Education policy frameworks	High-cost digital resources	Inadequate ICT capacity development programs for teachers
Inadequate ICT leadership	Budgetary constraints	Ineffective professional development culture at schools
Lack of clear mandates on how to integrate ICT in schools	Insufficient school ICT infrastructure (including e-Platforms)	Loss of classroom contact time to facilitate teacher training
	Poor access to the Internet	

Member states continue to make progress in surmounting these hurdles, but the rapid pace of technological advancement may well continue to leave the education system and teachers at least one step behind. Since the turn of the century, the various territories have engaged in policy strengthening initiatives for ICT in Education. Several of these territories have also undertaken massive technology projects that delivered laptops and tablets to schools and/ or students. Progress has also been recorded among some of the member states with the improvement of broadband Internet to schools. Less progress has been made with teacher ICT training, the development of digital learning content and the adoption of Learning Management Systems (LMS) or Virtual Learning Environments/Platforms (VLE). Despite sharing many of the same imperatives in our education systems, there

have seldom been any joint efforts or initiatives in the region to leverage technology for instruction in the classroom or online.

COVID-19 has changed the way we look at schooling. Whereas this crisis has placed our education systems in an emergency response mode, the present situation might provide real opportunities to strengthen the resilience of the region's education system. A broad assessment of the various VLEs and online learning activities in the region should provide some insights into how technology is being used to support learning in the region, what the capacities of teachers are and what gaps exist with respect to access to devices and the Internet. This type of regional assessment in combination with an examination of the relevant literature should help determine the best approaches and strategies for ensuring success with online learning modalities and which platforms can best support that success. This is especially important as it is widely accepted that online learning tools if used properly can help to augment classroom instructional activities. Further, we can anticipate because of geographic location and our socio and geo-political realities, that there are several other potential disrupters in addition to pandemic threats like COVID-19.

## **Literature Review**

### Leveraging Virtual Learning in the COVID-19 Context

#### *Frameworks for Online Learning*

The COVID-19 pandemic has forced educators globally to reconsider their approaches to instruction and adjust to the restrictions. Luckily, the field of online learning has been developing fast during the past decade, allowing contemporary educators to take advantage of distance teaching opportunities and continue the smooth delivery of services. Online learning has been underpinned by a variety of general and specific theories and concepts. While it was greatly informed by behaviorism, cognitivism, social constructivism, it has also been using more narrow theoretical frameworks of Community of Inquiry (CoI), Connectivism, and Online Collaborative Learning (OCL) (Picciano, 2017). These theories emphasize the importance of active learning, collaboration, and networks and the immense potential of information technology to enhance the learning experience in the online context.

The Community of Inquiry (CoI) model presented by Garrison, Anderson and Archer (2000) stresses that learning should be based on the three "presences," including social, cognitive, and teaching. In practice, it means that online activities should take the form of active learning environments guided by instructors and encouraging students to share information, ideas, and opinions (Picciano, 2017). Siemens (2004), the key proponent of Connectivism, explains that the chaotic and dynamic nature of information flows means that students should be taught to navigate this complex environment. Online Collaborative Learning (OCL), in turn, states that students need to take advantage of collaborative learning and the Internet and harness the power of networking (Harasim, 2012).

These theories aptly inform the delivery of online education in times of emergencies and pandemics, such as the current one. The Internet and various virtual learning platforms enable teachers to develop collaborative learning spaces where students can engage in active information seeking, analysis, and discussion. The flexibility offered by online instruction is exactly what students need to remain connected and adjust to the new demands set by the new social reality.

#### *Emergency Response Teaching versus Online Learning*

It is important to distinguish between traditional online learning and emergency response teaching (ERT). In simplest terms online learning is planned like this from the beginning, while ERT is a temporary change of instructional delivery to an online delivery mode due to a crisis (e.g., hurricane, epidemics, etc.) (Hodges et al. 2020). The aim of ERT is not to "re-create a robust educational ecosystem" but to ensure that students can access learning resources without interruptions (Hodges et al., 2020, n.p.). ERT may be the only available solution in crisis circumstances, but research shows that educators face numerous challenges associated with rapid course redesign and switching to different learning theories and philosophies (Mackey et al., 2012). The example of the Caribbean region which is gravely affected by natural disasters shows that the gradual development of online and

blended learning instead of reliance on ERT may be justified to ensure smooth instruction delivery (Nguyen & Pham, 2018).

The COVID-19 pandemic highlighted the need to harness Learning Management Systems (LMS) and Virtual Learning Environments (VLE) to support learning at a distance when classes are suspended. Teachers can take advantage of all four distance learning modalities, including video/television, radio/audio, mobile phone software, and online learning (Morris & Farrell, 2020). However, the recent evidence shows that a smooth transition from traditional learning to ERT is challenging due to inadequate online teaching infrastructure, the lack of teacher training, unequal access to the Internet and computers, the complex environment at home, and so on (Zhang et al., 2020). In relatively low-income countries and regions such as the Caribbean, the situation may be complicated by the fact that not all students and teachers have access to the required equipment and stable Internet connection.

### *Teacher Competencies*

The implementation of online instruction has revealed the need to upskill all online educators, irrespective of their experience, to optimize teaching in online environments (Martin et al., 2019). Teacher performance and competencies are vital for efficient instructional delivery online. To realize any success in these new modalities, teacher must possess pedagogical skills/know-how and technical/ technological Skills (Spector & de la Teja, 2001).

#### Pedagogical Skills/know-how

Archambault & Larson (2015) explain that when creating courses for online platforms, teachers need to keep in mind that the platform is not traditional and understand the unique characteristics of online learning. This may pose a challenge for educators to meet the learning needs of this transformed platform of learning, but it is crucial to adapt to the changes taking place in the advancement of instruction. Researchers have organized pedagogical skills into the following categories (Pulham, 2018; Roy & Boboc, 2016):

1. Educational and targeted preparation
2. Content expertise, abilities, and inclination towards educational technologies
3. Learning methodology for online education, administration, skills for course delivery

#### Technical/ Technological Skills

In the context of this research technical/ technological skills refer to the skills required to create engaging and aligned resources and environments for online instruction. Ally (2008) explains that the application of the Internet to use educational content, to 'interact' with the course materials, students, and know when to seek assistance if required are critical technological skills that facilitate an e-learning instructor. Archambault & Larson (2015) emphasize that training in educational technologies helps teachers to be up to date with the recent technological advancements.

The research points to the following essential skills:

1. Educators must know how to utilize applications and programs such as Learning Management Systems (LMS) like Blackboard, Moodle, Edmodo, Google Classrooms etc.
2. Educators must know how to use applications specific to their content area to create extensive technologically integrated learning environments. These may include content authoring tools and tools to support real-time interaction such as videoconferencing.
3. Educators must know how to moderate and facilitate, online communication such as messaging and discussions (Collison et al., 2000).

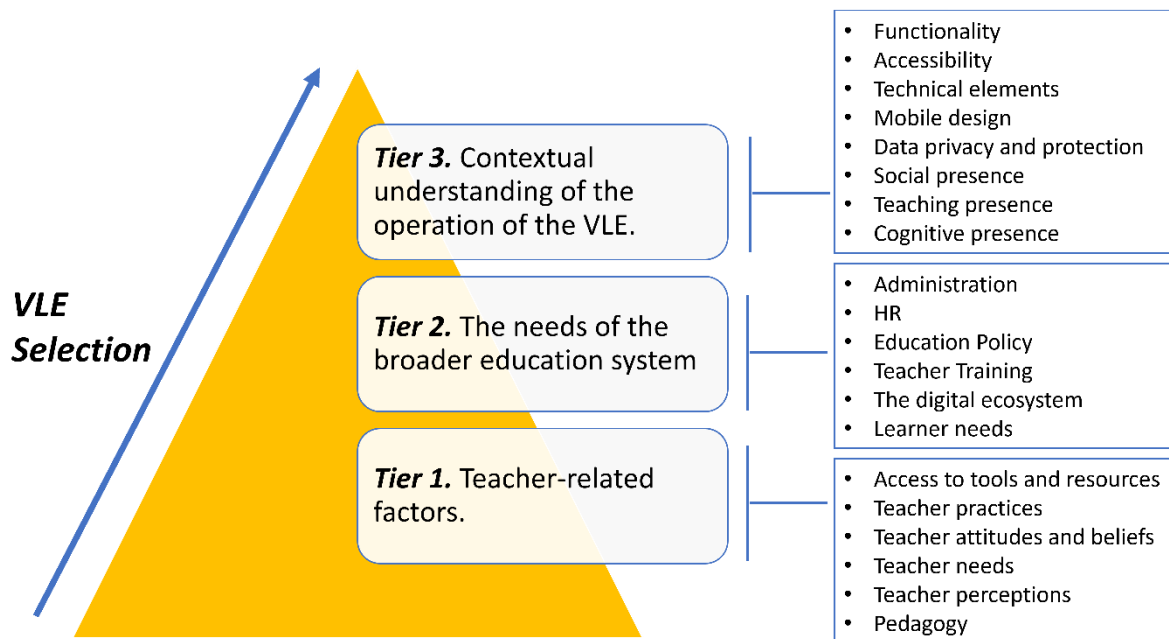
### *Virtual Learning Environments*

The literature makes it clear that transitioning to online learning requires critical decisions as concerns the most effective virtual learning environment. Most of these decisions are contextual. Key contextual issues include:

1. The presence of ICTE policy.
2. Alignment of educational activities and the digital ecosystem.
3. The nature of the digital divide.
4. Teacher factors such as personal beliefs, self-efficacy, and perceptions of the usefulness of e-modalities.

These issues suggest a three-tier approach to the selection of an effective VLE (Figure 1.).

Figure 1.  
*Three tier-approach to VLE selection.*



The first tier involves engaging teachers to understand their level of access, their perceptions, practices, competencies and needs that can act as barriers to successful adoption (Zehra and Bilwani, 2016). It is therefore imperative that in assessing any VLE we understand how teachers relate to it, and how they perceive the tool adding to or aligning with their practices.

The second tier involves understanding the needs of the broader education system. Research shows that organizational factors were found to be the most significant determinant for adopting e-Learning (Shraim, 2010).

The final tier involves a contextual understanding of the operation of the VLE even before any move towards implementation. Anstey and Watson (2018) in delineating a framework for evaluating eLearning tools saw the need for such a predicative evaluation to be undertaken not only by technology experts, but by teachers as well. Research points to the key features any VLE should possess to ensure successful implementation (Anstey and Watson, 2018; Omer, 2018, Brull et al, 2017). These include functionality, accessibility, technical elements, mobile design, data privacy and protection, social presence, teaching presence, and cognitive presence (Appendix B.I).

## Methodology

This project employed a descriptive survey design to understand the characteristics of education systems and practitioners in the OECS in the application of virtual teaching as a response to the COVID-19 pandemic.

### Objectives

1. The research sought to meet the following objectives:

2. To determine the nature of engagement with virtual learning environments (VLEs) among the OECS territories.
3. To determine teacher readiness for engaging in VLEs inclusive of:
  - a. Teacher practices
  - b. Teacher competencies
4. To determine teacher training needs for effective engagement with VLEs.
5. To determine the suitability of selected VLEs to support instruction within the OECS context.

#### Data Collection and Analysis

Four instruments were used to gather data for this assessment:

1. A Survey Instrument for Ministries of Education (Appendix A)
2. A questionnaire for teachers (Appendix A)
3. A matrix for assessing VLE's (Appendix B.I)
4. Interviews with key VLE/ LMS distributors/ developers

All survey instruments were administered via online modalities, and therefore respondents are delimited to those who could be reached via this modality.

A simple random sampling method was used for data collection. Owing to the limitations presented by COVID-19 restrictions Ministries of Education from the different OECS territories were tasked with distributing the instrument via email. Table 2. presents a distribution of the sample. Interviews were conducted using web-conferencing platforms. These were recorded and transcribed.

Table 2.  
*Distribution of sample.*

	AN	DM	GR	MS	SKN	SL	SVG	BVI	Total
Early Childhood	1	2	83	0	10	5	7	1	109
Primary	46	114	167	7	181	524	292	56	1387
Secondary	18	79	77	1	140	249	176	67	807
Post-Secondary/Tertiary	4	9	5	0	19	33	14	12	96
<b>Sample</b>	<b>69</b>	<b>204</b>	<b>332</b>	<b>8</b>	<b>350</b>	<b>811</b>	<b>489</b>	<b>136</b>	<b>2399</b>
<b>Population</b>	<b>246</b>	<b>1200</b>	<b>1858</b>	<b>80</b>	<b>800</b>	<b>2300</b>	<b>1680</b>	<b>450</b>	<b>8568</b>
<b>Response Rate</b>	<b>35%</b>	<b>17%</b>	<b>18%</b>	<b>10%</b>	<b>44%</b>	<b>35%</b>	<b>29%</b>	<b>30%</b>	<b>28%</b>

Key:

AN – Anguilla  
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A mixed methods approach was applied to the analysis of the data gathered in this assessment. Items from interviews conducted and other open-ended items which produced qualitative data were analyzed using a process of "open-coding" (Strauss and Corbin, 1990) in which the available literature was used to identify conceptual categories into which the research themes could be placed. The goal was to create descriptive themes which would form a framework for the analysis. Quantitative analysis was applied to items from the questionnaires used for data collection. Descriptive procedures were used to analyze numerical items. These procedures included frequency distribution, and measures of central tendency (descriptives). Data was collated and recoded for statistical procedures. Some key variables were also computed to support more in-depth analysis –teacher competency score, teacher competency level, VLE assessment score, VLE criteria assessment score (functionality score, technical score etc.). Inferential statistical procedures were also carried out.

## Findings and Discussion

The findings of this analysis of the transition towards virtual learning in OECS territories indicate that much is needed to transition from virtual teaching as emergency response teaching to virtual teaching as a dimension of instructional processes that adds value to our education systems. Research shows that in making that clear distinction, the overwhelming question is whether we are likely to re-create robust education systems grounded in technology mediated instruction that will continue to serve our learners or are we likely to revert solely to traditional modalities once the “all clear” is sounded (Hodges et al, 2020; Mackey et al, 2012). To achieve the former there must be clear alignment of frameworks for what constitutes an acceptable e-Learning platform, and the pedagogical and technical/technological skills for effective use of that platform, along with the teacher training needs for continued effective use of the platform. The research points to the following key findings:

### Engagement with virtual learning environments (VLEs) among the OECS territories.

Teachers employ a variety of VLEs to support instruction (Table 3.). These platforms include those designed specifically for education (eLearning platforms), messaging apps that support multimedia, and web-conferencing tools. What is evident is that teachers take an eclectic approach to the use of these platforms. It is likely that they will use different platforms based on the instructional activities for the given session. Platforms also vary according to grade level.

Table 3.

*Distribution of platforms for delivery of Instruction during COVID-19 Pandemic*

Platform	Frequency	Percentage
WhatsApp	1736	72%
Zoom	831	35%
Google Classroom	820	34%
Edmodo	456	19%
Microsoft Teams	143	6%
Moodle	84	4%
Khan Academy	70	3%
SeeSaw	36	2%
None	30	1%
BigBlueButton	16	1%
Notesmaster	15	1%
Schoology	12	1%
EDU 2.0	9	0.4%

The literature points to the need to bring together all critical players and factors in deciding on a suitable VLE. In the context of the OECS, the aim is to provide a unified platform that addresses the instructional and administrative needs of all territories, but also serves as a tool to monitor the provision of education within the OECS context. Presently, the fact that nine different platforms are being used based on country, educational level, and teachers’ instructional decisions suggests the interplay of too many idiosyncratic factors in the decision-making process. This is contrary to the Community of Inquiry (Garrison, Anderson and Archer, 2000), and Online Collaborative Learning (Harasim, 2012) models which inform virtual learning environments that bring together different organizations with similar educational aims. Teachers and students should be able to share content and interact across classes, schools and territories in order to support truly connected learning. Research has shown that there is a clear link between learning that is socially driven and broadened beyond the cultural and physical confines of the learner; and academic achievement, career success and civic engagement (Ito et al, 2013; Siemens, 2004).

The findings also indicated that teachers’ choice of VLE is based on their perceived efficacy of the platform to support instruction (Table 4.). Specifically, the functionality of the platform (ease of use, teacher competence in using the specific platform, students comfort level). This suggests that teachers gravitated towards certain technologies because of ease of use and their own competencies. This may explain the prevalence of platforms

such as WhatsApp and Zoom as viable means of facilitated instruction. However, these tools, used in isolation, do not allow for the range of processes that support effective instruction or any meaningful cognitive development.

Table 4.  
*Factors influencing teachers' choice of VLE*

	Frequency	Percent
The platform is easier to use	942	40%
It was free	839	36%
I am more competent using the platform	814	35%
My students are more comfortable using this platform	813	35%
This was the choice of the Ministry of Education	683	29%
This was the choice of my school	672	29%
My device better supports the use of this platform	460	20%
This platform works well with my connectivity at home	400	17%

### Teacher readiness for engaging in VLEs

MOEs had a positive perception of teacher readiness to transition to online learning (Table 5.). They generally believed that many of their teachers were prepared for online instruction and that some may be anxious about using eLearning tools.

Table 5.  
*MOE Ratings on Teacher Readiness*

	$\bar{x}$	AN	BVI	DM	MS	SL	SKN	SVG	AT	GR
Teachers are prepared to deliver courses online	3.00	3	3	4	2	5	3	2	3	2
Teachers are anxious about using e-learning tools	3.56	2	3	3	4	5	4	4	3	4
Teachers are aware of the implications of computer technology on teaching and learning	3.56	4	3	4	3	5	3	4	3	3
Teachers are trained to address the implications of computer technology on teaching and learning	2.67	2	4	3	2	4	2	2	3	2
Teachers are interested in increasing their knowledge in online teaching	3.89	4	4	5	4	4	4	4	4	2
Teachers are interested to use instructional technologies in the future	4.00	5	4	5	4	4	4	4	4	2
Teachers are able to access the technologies required for the courses	3.67	4	4	4	4	4	4	2	2	5
Teachers have sufficient training for professional development for online teaching	2.56	3	3	3	3	3	2	2	3	1

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The research also revealed that although both the MOEs and teachers generally indicate a moderate level of competency in delivering online instruction (Table 6.), teachers are generally not very competent in using specific eLearning platforms for instruction (Table 7.).

Table 6.

*Teacher Competencies on a Learner Management System or eLearning Platform*

	n	Min	Max	$\bar{x}$	$\sigma$
Effectively deliver instructions online, presently	2384	1	4	2.55	.806
Effectively deliver assessment activities online, presently	2384	1	4	2.43	.851
Login to the system or platform	2375	1	4	2.93	.891
Link additional learning resources on the Web	2380	1	4	2.56	.962
Upload learning resources from your computer	2376	1	4	2.71	.961
Manage students' access to the learning resources	2384	1	4	2.38	.909
Communicate announcements to students	2384	1	4	2.78	.896
Allow parents permission or access to resources	2379	1	4	2.45	.942
Add interactivity to instructional activities	2387	1	4	2.40	.926
Assign students work or tasks	2384	1	4	2.76	.899
Give students feedback on assignments	2373	1	4	2.66	.908
Grade assessment activities	2382	1	4	2.50	.946

Table 7.

*Teachers' ability to use e-platforms mean.*

	n	Min	Max	$\bar{x}$	$\sigma$
Ability to use Moodle	2350	1	5	1.91	1.055
Ability to use Zoom	2349	1	5	3.30	1.226
Ability to use Google Classroom	2329	1	5	2.64	1.341
Ability to use Bigbluebutton	2337	1	5	1.59	.775
Ability to use Edmodo	2340	1	5	2.36	1.283
Ability to use EDU	2343	1	5	1.57	.743
Ability to use See Saw	2335	1	5	1.62	.811
Ability to use Khan Academy	2341	1	5	1.88	1.047
Ability to use Notesmaster	2347	1	5	1.70	.889
Ability to use Email	2344	1	5	4.03	1.196
Ability to use WhatsApp	2345	1	5	4.30	.962
Ability to use Microsoft Teams	2285	1	5	2.09	1.214

### **Teacher training needs for effective engagement with VLEs**

Although the findings show that a range of training sessions have taken place across the OECS (Table 8.), many of these sessions seem a response to the needs of individual territories and/or schools at the point in time, and not a holistic and systemic response to the needs of teachers for engaging in effective technology enabled instruction. To support a unified approach to VLEs across the member states it is critical that focused and sustained training that is aligned to participants' occupational activities and the VLE of choice be provided. This training should support an experiential approach. This will provide participants with opportunities to reflect on present pedagogical and technology practices and rationalize how they can be improved or redefined to add value to educational processes. The literature indicates that developing competence in using the technology should not be the sole focus of training. Along with a high degree of competence, teachers need to be motivated to learn new things and maintain professional development. Inevitably, any training regime must also target the affective domain.

Table 8.

*Teacher training in online modalities during COVID-19 (2020)*

Moodle LMS										
	Total	AI	VG	DM	MS	SLU	SKN	VC	AG	GD
Training conducted?	1	No	No	No	No	No	No	Yes	No	Yes
No. Of Teachers trained?	1402							40		1362
Training Delivery								B		OL
Training duration (hrs)								8		10
Post training monitoring?	1							Yes		No
Google Classroom										
	Total	AI	VG	DM	MS	SLU	SKN	VC	AG	GD
Training conducted?	6	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
No. Of Teachers trained?	5031	105	546	700	80	3000		100	500	
Training Delivery		OL	B	OL	OL	OL		OL	B	
Training duration (hrs)		20	10	4	2	3		3	6	
Post training monitoring?	4	Yes	Yes	No	No	Yes		No	Yes	
Edmodo										
	Total	AI	VG	DM	MS	SLU	SKN	VC	AG	GD
Training conducted?	3	Yes	No	No	No	No	No	Yes	Yes	No
No. Of Teachers trained?	400	100						100	200	
Training Delivery		OL						OL	B	
Training duration (hrs)		15						3	6	
Post training monitoring?	1	No						No	Yes	
Microsoft										
	Total	AI	VG	DM	MS	SLU	SKN	VC	AG	GD
Training conducted?	3	No	No	No	No	No	Yes	Yes	Yes	No
No. Of Teachers trained?	1075						800	200	75	
Training Delivery							OL	OL	B	
Training duration (hrs)							4	2	4	
Post training monitoring?	1						No	Yes	No	
Other										
	Total	AI	VG	DM	MS	SLU	SKN	VC	AG	GD
Training conducted?	3	Yes	Yes	No	No	No	No	No	Yes	Yes
No. Of Teachers trained?	738	57	546						100	45
Training Delivery		OL	OL						B	OL
Training duration (hrs)		20	10						4	30
Post training monitoring?	3	Yes	Yes						Yes	No

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B: Blended

OL: Online

### The suitability of selected VLEs to support instruction within the OECS context.

An evaluation of eLearning platforms based on eight operational criteria revealed that Moodle LMS, Khan Academy and Edmodo are the three top rated platforms for supporting instruction in our context (Tables 9a, 9b). The evaluation further points to the fact that VLEs designed for Caribbean use do not feature well. One reason is that teachers may not have been aware of those tools because of lack of exposure. The data on teacher training in technology enabled instruction reveals that there is a clear alignment between the tools used by teachers and the training that they were exposed to. The findings reveal that no training was provided in the use of Notesmaster. Furthermore, the interview with the developers revealed that there has not been much marketing of the product as a viable VLE in the OECS context. Inevitably, if contextually relevant VLEs are to find prominence in our education systems the stakeholders at the first tier of the decision-making process should have a consistent degree of exposure to the tool.

Table 9a.

#### Assessment of e-platforms

	Google Classroom		Edmodo		EDU 2.0/ NEO		Khan Academy		CXC Learning Hub	
Functionality Score	10	83%	11	92%	11	92%	10	83%	9	75%
Accessibility Score	10	83%	10	83%	10	83%	12	100%	9	75%
Technical Score	11	92%	10	83%	10	83%	12	100%	11	92%
Mobile Design Score	6	67%	6	67%	6	67%	9	100%	5	56%
Privacy, Data Protection, and Rights Score	8	89%	8	89%	8	89%	8	89%	8	89%
Social Presence Score	8	89%	9	100%	8	89%	9	100%	5	56%
Teaching Presence Score	5	56%	5	56%	9	100%	8	89%	5	56%
Cognitive Presence Score	4	44%	4	44%	7	78%	8	89%	3	33%
Total	62	77%	63	78%	69	85%	76	94%	55	68%

Table 9b.

#### Assessment of e-platforms

	Microsoft Teams		Moodle LMS		Notesmaster		WhatsApp		Zoom	
Functionality Score	9	75%	11	92%	7	58%	5	42%	5	42%
Accessibility Score	8	67%	12	100%	9	75%	6	50%	4	33%
Technical Score	11	92%	12	100%	11	92%	0	0%	9	75%
Mobile Design Score	6	67%	8	89%	6	67%	6	67%	7	78%
Privacy, Data Protection, and Rights Score	8	89%	8	89%	6	67%	1	11%	1	11%
Social Presence Score	8	89%	9	100%	7	78%	5	56%	5	56%
Teaching Presence Score	5	56%	9	100%	4	44%	1	11%	1	11%
Cognitive Presence Score	4	44%	9	100%	6	67%	0	0%	0	0%
Total	59	73%	78	96%	56	69%	24	30%	32	40%

## Recommendations:

The following recommendations were generated based on the literature and the findings of the research:

1. There is need to develop a unified policy and set of guidelines on e- Learning as part of a broader technology enabled learning/ ICTE policy.
2. The member states of the OECS should adopt a single unified virtual learning platform (or at least take a unified approach to what should be the minimum requirements for such a platform).
3. The member states should engage in an awareness building initiative to motivate teachers to adopt “official” Virtual Learning Environments (VLE) or platforms. There is too much risk associated with VLEs chosen based on idiosyncratic factors. This initiative should involve identifying and empowering good teachers with advanced ICTE skills who will help facilitate training, coaching and monitoring; and delivering Certified ICTE Programs including modules in the use of VLEs, virtual teaching, course design and content management for school leaders and teachers.
4. There is need to adopt ICT in Education (ICTE) Professional Development and Training Standards for school leaders and teachers.
5. The member states should establish minimum standards for teacher and student devices. These standards should be aligned to the VLE of choice, and expectations of further technological improvements of the platform.
6. The member states should consolidate ICTE resource procurements in the region.
7. Based on the findings of this research the critical success indicators of a VLE for the OECS member states are delineated in the Appendix 3.

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## Appendices

### Appendix A. Instrumentation

Questionnaire 1. – Ministries of Education, OECS

Sharing Link: <https://forms.gle/hYj2GRWDfMk7HZjf9>

Questionnaire 2. – Teachers, OECS

Sharing Link: <https://forms.gle/5xtaSAjUJcNiJ9v88>

### Appendix B.I

*Assessment Criteria for Virtual Learning Environments (Adapted from Anstey and Watson, 2018 by CC BY-NC-SA 4.0)*

Criteria	Description
Functionality	Functionality considers the extent to which the VLE functions as an instructional tool.
Accessibility	Accessibility covers both the flexibility of the tool in meeting the demands of the curriculum and supporting multiple learning approaches; and meeting the specific needs of learners with disabilities.
Technical Elements	Technical elements consider what basic technologies (hardware and software) are needed to successfully use the tool.
Mobile Design	Mobile design considers the portability of the tool across multiple devices.
Data Privacy	Data Privacy and Protection assesses the risks involved in signing into the tool, and the rights users have as it relates to the information that they share.
Social Presence	Social Presence examines how the tool can support communities of learning; whether the tool can help teachers create environments that support collaboration and teamwork.
Teaching Presence	Teaching presence explores how the tool can help teachers establish and maintain teacher presence through well designed facilitation, opportunities to provide feedback and support to learners; and to establish direction in learning.
Cognitive Presence	Cognitive presence considers what features of the tool support students' cognitive engagement in learning tasks.

### Appendix B.II

Complete evaluation of platforms used during emergency response teaching in the OECS (2020)

Shared Link:

<https://docs.google.com/spreadsheets/d/1C-F4Y1OQyYAercaiGYuShAXwv5AdwLUgY2CG31THBSg/copy?usp=sharing>

## Appendix C.

### *Critical Success Factors for Effective VLE implementation*

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<b>Attribute</b>	<b>Description</b>
Accessibility	The platform should be fully accessible and usable for all users regardless of ability. The platform should integrate assistive technologies for students with disabilities and special needs.
Analytics	The platform should provide a wide variety of reports and logs that allow instructors to track student progress and successes. Teachers and administrators should be able to track learner engagement, flag learner practices and hold learners accountable. Learners should also be able to track their on progress.
Content Repository/ Access	There should be opportunities for teachers to create, upload, share and access resources to support instructional activities. Users should be able to upload files from a variety of outside file repositories, including Dropbox, Flickr, Google Drive, and traditional computer upload.
Course Management	Teachers should be able highly customize their course setup and management. Administrators should be able to integrate student information systems with the platform for seamless data management.
Data Privacy and Protection	User data should reside within the domain of the Ministries of Education. There must be clearly communicated privacy policy about ownership and reusability of user resources. Generally, privacy policies should be clearly communicated.
Effective Instruction	The platforms should effectively support well designed facilitation and opportunities for feedback. The platforms should provide features that support students' cognitive engagement in learning tasks.
Live Engagement	There should be opportunities for synchronous activities such as chats and video conferencing. This functionality may be in-built or added as a third-party plugin that requires minimal software installation.
Multi-platform accessibility	The platform can be used on a range of devices without significant differences in access to resources on the platform.
Usability	The platform is aligned to competencies of teachers in VLE use. Use the platform require minimal technological skills. A training plan is designed to bring teachers to competency levels for effective use of the platform.

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